



**UNITED STATES DEPARTMENT OF COMMERCE**  
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/926,592	09/04/97	YAMAZAKI	S 0756-1717

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MMC1/0606

EXAMINER

PERTVE

ART UNIT

PAPER NUMBER

2813

DATE MAILED:

06/06/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

08/926.592

Examiner

Evan T. Pert

Applicant(s)

YAMAZAKI, SHUNPEI

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 06 September 2001.
- 2a) ☐ This action is **FINAL**.
- 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 13, 16, 17 and 21-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13, 16, 17 and 21-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some \* c) ☐ None of.
  - 1) ☐ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage.

- 14) ☐ The translation of the foreign priority document(s) is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

# 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

## DETAILED ACTION

### *Information Disclosure Statement*

1. Applicant's comments in paper no. 34 are acknowledged regarding the examiner's notations regarding English translation on the IDS forms of paper numbers 19 [2-22-00] and 25 [9-25-00]. Accordingly, the examiner has located and considered the English translations provided, and has included revised initialed IDS forms for paper numbers 19 and 25 with this communication.
2. Applicant's comments in paper no. 34 are acknowledged regarding an unacknowledged IDS 1449 form filed 1-4-01. However, the examiner is unable to locate this unacknowledged IDS form in the record or evidence of entry by way of the computer tracking system internal to the office. Applicant is advised to provide the missing IDS filed 1-4-01 with the response to this Office Action for consideration of the references therein.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made
4. Claims 13, 16-17, 21, 23-26 and 28-30 are rejected under 35 U.S.C. 103(a) as

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Claims 13, 16, 17, 21 and 26

As "prior art", Sherman teaches forming layers of insulating materials utilizing a plasma "vapor reaction method", said materials including silicon nitride and silicon oxide [col. 1, lines 16-52]. It would have been obvious to one of ordinary skill in the art, at the time of applicant's claimed invention, to form an interlayer film of silicon oxide with a silicon nitride layer applied for passivation [col. 1, lines 43-45]. Alternatively, one of ordinary skill in art would be motivated to first apply a layer of silicon nitride over transistors formed on a substrate, followed by an oxide interlayer film as was well known at the time of applicant's claimed invention. Since the apparatus of Sherman is well suited for deposition of various film materials [source gasses 46, Fig. 4], it would have been obvious to one of ordinary skill in the art to use Sherman's apparatus to form a silicon nitride layer on a silicon oxide layer, or oxide on nitride, depending on the desired application.

One of ordinary skill in the art would motivated to choose silicon oxide for its lower dielectric constant, for example, while being motivated to choose silicon nitride for its superior passivation quality, non-oxidizing quality, or higher dielectric constant.

Regarding the pair of claimed "electrodes" Sherman teaches parallel electrodes 23 and 25a (Fig. 4) that are obviously "prepared within a reaction chamber" since they clearly exist in a reaction chamber as depicted. The substrates are obviously

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Regarding the claimed "introducing" and "exciting" of "first" and "second" film forming gasses, it would have been obvious to "introduce" the gas necessary for the layer being deposited by metering the appropriate source gas 46, motivated by the intended operation of Sherman's apparatus. It would have been obvious to "excite" each of the gasses introduced for vapor deposition as this is the intended mode of operation of the "plasma" in the plasma CVD apparatus of Sherman. Alternatively stated, the steps of "introducing" and "exciting" gasses 46 in the apparatus depicted in Fig. 4 of Sherman are inherent to the operation of the apparatus, the apparatus being a plasma deposition and etching system.

Regarding the cleaning of unnecessary layers inside the reaction chamber on the walls and electrode, Sherman teaches using nitrogen fluoride to etch away the unwanted deposits [col. 5, lines 10-27].

Regarding the claimed "removing" of the substrate, one of ordinary skill in the art would obviously be motivated to remove the substrate before cleaning; otherwise, the deposited layers of insulating films would be etched from the wafer itself (instead of cleaning only the undesired surfaces inside the reaction chamber).

#### Claims 23 and 28

Operating Sherman's apparatus to form a film deposit is inherently a plasma CVD process since gasses are vapor reacted in a chamber having a plasma [col. 4, line

Claims 24 and 29

In the apparatus of Sherman, the nitrogen fluoride cleaning gas is inherently "excited" by an RF field, such as 700 watts of RF power [col. 5, lines 32-36].

Claims 25 and 30

As depicted in his Fig. 4, Sherman's apparatus is configured such that all gasses are inherently introduced through the upper electrode manifold 25a, said gas passing through a well-known "plurality of ports".

5. Claims 22 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sherman as applied to claims 21 and 26 above, and further in view of Tanaka et al. (U.S. Patent 4,525,381). Tanaka et al. teach an advantage of adding ultraviolet light irradiation to Sherman's apparatus [abstract], which inherently forms a kind of "photo CVD".

It would have been obvious at the time of applicant's invention to modify Sherman's apparatus to include ultraviolet light because, in this way, according to Tanaka et al., "a vapor-deposited film can be formed with high efficiency, because a large quantity of ultraviolet rays can be applied to the substrate without any damage of the vapor-deposited film" [abstract].

***Response to Arguments***

6. Applicant's arguments with respect to claims 13, 16-17 and 21-30 have been considered but are not persuasive. It is noted that the prior art does not teach the

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan T. Pert whose telephone number is 703-306-5689. The examiner can normally be reached on M-F (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Bowers can be reached on 703-308-2417. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for after hours communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ETP  
December 29, 2001

*K. Christian*  
Keith Christian  
Primary Examiner  
Technology Center ISSU